precipitation was quantitatively inadequate to account for runoff largely was laid to rest.

Perrault's discourse includes also the first, or at any rate a very early, description of (i) sublimation of ice and snow, documented by loss of weight from a continuously frozen block of ice; (ii) interception of snow by trees and consequent loss of moisture to the forest floor; (iii) bank storage and alternate recharge to and discharge from aquifers in hydraulic continuity with rivers (of course he did not use the modern terms); (iv) fresh-water-salt-water relations, with some concept of the importance of the differing densities of the two fluids in explaining fresh-water wells near sea coasts; and (v) the role of slow drainout of saturated earth materials in maintaining the low flow of rivers. Oddly enough, Perrault persisted in believing that springs are fed by rivers and steadfastly refused to believe that precipitation could wet the soil and rock to depths sufficient to allow what we now would call recharge. From sources obscure, he also maintained the existence of a universal layer of clay at varying depths below land surface and attributed to the clay a major role in control of movement of water underground.

A discussion of that clay layer and a taste of the turgid style that permeates the book follows:

> The cause of these fluctuations is due to the arrangement of the continuous clay that is under the low plains and under the mountains, I mean that when the slope of this clay is not toward the current of the River, and that there is a cavity there in which much water remains which cannot flow into the River with the rest, or else that there is one or many of these basins we have mentioned, larger than in other places, the waters that remain in them can supply the continual evaporations, and the springs they produce flow with a continuous and almost even flow, because there is enough material to keep them in that state: but when this clay slopes toward the River, and there are only a few of these basins, or they are small, or there are none at all; and that by these means the water that is in the sands flows to the River, and these basins being small are soon emptied, the springs thereby suffer various decreases, and sometimes dry up entirely: so also on the contrary when the overflow water of Rivers has risen enough to enter these basins and on top of these beds of clay higher than the usual ones, which does not happen often; then since there is more material for evaporation, the springs become stronger and have more than usually copious and abundant flow.

The style, clearly, is Perrault's. The translator has leaned toward the literal rather than the interpretative translation in order, he says, to avoid reading into his statements more than Perrault knew or intended.

Soil scientists will be fascinated by a section (pp. 78–81 of the translation) that describes Perrault's expansion of Magnanus' studies in capillary rise, flow in unsaturated media, and demonstration that passage of salty water through soil does not—as many ancients maintained—remove the salt. The translator suggests that Perrault deserves a place as a precursor of soil scientists.

This is an important book in the history of earth sciences. Its appearance in English is a tribute to the diligence and scholarship of the translator—it is copiously and excellently footnoted—and to the zeal of George W. White, recently elected vice-president for North America of the International Commission for the History of Geological Sciences. White "practically commissioned" the work by presenting La-Rocque with a copy of Perrault's book on the condition that he translate it, as he also stimulated A. V. Carozzi to translate J. B. Lamarck's *Hydrogeology* (University of Illinois Press, 1964).

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Nuclear Structure

Unified Theory of Nuclear Models and Forces. G. E. BROWN. North-Holland, Amsterdam; Interscience (Wiley), New York, ed. 2, 1967. 271 pp., illus. $9.25.

The second edition of Brown's book calls for a second edition of this review [the first appeared in *Science* **148**, 622 (1965)]. The book has grown by simple accretion, by addition of chapters with no molding of the earlier chapters to the new need. The original title "Unified Theory of Nuclear Models" implies an explanation, from a common ground, of why the shell model, the optical model, and the collective model work; but there is very little of the fascinating applications to nuclei that give life to the models. The "and Forces" added to the title in the second edition is not descriptive of the added content, which is mainly a treatment of nuclear matter with its "effective forces" and alludes to the meson theory of nuclear forces only as it relates to these.

It is helpful to have impressive and difficult aspects of nuclear structure elegantly and concisely presented, but the book has too high a ratio of mechanics to philosophy, of superb mathematical tricks to needed transitional thought. It may help the very exceptional student soar, but in the hands of others it could contribute to the lamentable process of bringing up a generation of physicists adept in applying specialized tools but without a facility for approaching new problems.

The dubious pedagogy of compressing very involved nuclear-matter calculations into three additional chapters is illustrated by the question the reader encounters: What does it mean to create two holes in the single state m? One learns how to evaluate diagrams containing them, but not why. The answer would involve the additional bookkeeping of canceling disconnected diagrams, an operation which in a lecture might be called tedious but without which one wonders why one should be dazzled with the diagrams at all.

There is a lot of hard work being done and to be done to further our understanding of nuclei. The book is ambitious and perceptive in showing where hard work is being done and in doing some of it. Understanding could be improved if the link with first principles were firmer.

At one lighter point, with a lack of subtlety not typical of the serious parts, the author garbles de-Shalit's familiar introduction to a talk on finite nuclei: "Some of my best nuclei are finite."

Despite shortcomings, despite some disunity in the presentation of a "unified" theory, it must be said that nowhere else is to be found in so little space so much of the main thread of the far-flung and rapidly evolving modern theory of nuclear models.

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On Telling

Speaking and Writing in Medicine. The Art of Communication. CLIFFORD F. HAWKINS. Thomas, Springfield, Ill., 1967. 177 pp., illus. $8.50.

The broad appeal of this book is partly hidden by the "in medicine" of the title. Two chapters, which occupy only about one-sixth of the text, are in the particular province of the medical practitioner: "Listening to patients" and "Talking to patients." Their central focus can be described in a phrase: the doctor himself as a therapeutic